

## Pressure and Temperature Transmitters

# ATM.1ST/T - High Precision Transmitter



### CUSTOMER BENEFITS

- High precision pressure and temperature sensor over the whole temperature range thanks to electronic compensation
- Selectable pressure and temperature measuring range
- Fast customization due to modular product design
- Short response time suitable for dynamic pressure measurements

# Technical Specifications

## PRESSURE MEASURING RANGE (BAR)

|                                 | 0.1 ... 0.5, (1)       | > 0.5 ... 2            | > 2 ... 25             |
|---------------------------------|------------------------|------------------------|------------------------|
| Overpressure                    | 3 bar                  | 3 x FS ( $\geq 3$ bar) | 3 x FS                 |
| Burst pressure, (2)             | > 200 bar              | > 200 bar              | > 200 bar              |
| Accuracy, (3), ( $\pm$ % FS)    | $\leq 0.25 / \leq 0.1$ | $\leq 0.25 / \leq 0.1$ | $\leq 0.25 / \leq 0.1$ |
| Total Error, (4), ( $\pm$ % FS) |                        |                        |                        |
| 0 ... 70°C,<br>(typ./max.)      | $\leq 0.8 / 1.0$       | $\leq 0.3 / 0.5$       | $\leq 0.3 / 0.5$       |
| -25 ... 100°C,<br>(typ. / max.) | $\leq 1.3 / 1.5$       | $\leq 0.75 / 1.0$      | $\leq 0.75 / 1.0$      |
| Response time, (typ.)           | < 1ms / 10 ... 90% FS  | < 1ms / 10 ... 90% FS  | < 1ms / 10 ... 90% FS  |
| Long term stability, (5)        | < 0.5% FS / < 4 mbar   | < 0.2% FS / < 4 mbar   | < 0.1% FS / < 0.2% FS  |

(1) 50 mbar on request

(2) Transducer

(3) Zero based accuracy according to DIN-16086, incl. hysteresis and repeatability at ambient temperature

(4) Total error including accuracy and temperature influences at maximum signal span (16 mA)

(5) 1 year (typ. / max.), the long term stability can be improved by aging (burn-in) the sensor

## TEMPERATURE MEASURING RANGE

|                       |                |
|-----------------------|----------------|
| Standard, (1)         | -25 ... 100°C  |
| Lower end of range    | -50 °C         |
| Upper end of range    | 150 °C         |
| Temperature span, (2) | > 30 °C        |
| Accuracy, (3)         | < $\pm 0.5$ °C |
| Response time, (4)    |                |
| T 0.50                | 2 s            |
| T 0.63                | 3 s            |
| T 0.90                | 5 s            |
| Self heating, (5)     |                |
| Water, 0 m/s          | 0.05 °C        |
| Air, 0 m/s            | 1.0 °C         |

(1) Other temperature measuring ranges on request

(2) Measuring range 15 ... 30°C must be contained

(3) Probe, electronics, calibration

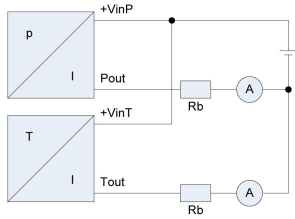
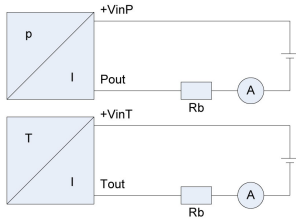
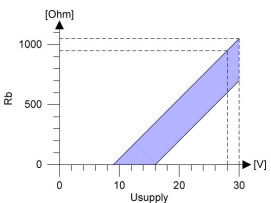
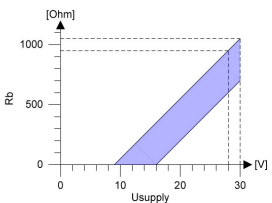
(4) Time in seconds that the sensor needs to carry out eg. 50% / 63% / 90% of a temperature change

(5) At minimum recommended load resistance

## TEMPERATURE RANGE

|                       |               |
|-----------------------|---------------|
| Operating temperature | -40 ... 125°C |
| Process temperature   | -40 ... 150°C |
| Storage temperature   | -40 ... 125°C |

## ELECTRICAL SPECIFICATIONS

|                         | 4 ... 20 mA / 3-wires   | 4 ... 20 mA / 4-wires  |
|-------------------------|---|--|
| Power supply            | 9 ... 30 VDC  | 9 ... 30 VDC   |
| Supply influence        | < 0.05% FS  | < 0.05% FS   |
| Circuit diagram         |  |  |
| Load resistance         |  |  |
| Minimum load resistance | $RL = (U_{supply} - 15V) / 0.02A$   | $RL = (U_{supply} - 15V) / 0.02A$  |
| Maximum load resistance | $RL = (U_{supply} - 9V) / 0.02A$  | $RL = (U_{supply} - 9V) / 0.02A$   |
| Load influence          | < 0.05% FS  | < 0.05% FS   |

## QUALIFICATIONS

|               | Description             | Level   | Typical interferences       |
|---------------|-------------------------|---|-----------------------------|
| EN 60068-2-6  | Vibration               | 4 G (4 ... 100 Hz / ± 3.2 mmpp)               |                             |
| EN 60068-2-27 | Shock                   | 100 G (impulse duration 6 ms)                 |                             |
| EN 55022      | Emission, class B       | < 30 dBμV/m (0.03 ... 1 GHz)                  |                             |
| EN 61000-4-2  | Electrostatic discharge | 8 kV contact / 15 kV air                      |                             |
| EN 61000-4-3  | Irradiated RF           | 10V/m (0.08 ... 2.7 GHz, 3s)                  | Radio sets, wireless phones |
| EN 61000-4-4  | Transients (burst)      | 4 kV  | Motors, valves              |
| EN 61000-4-5  | Surge                   | Line-Line: 0.5 kV/42 Ω, Line-Earth: 1 kV/42 Ω | Overvoltage                 |
| EN 61000-4-6  | Conducted RF            | 3 V (0.15 ... 80 MHz, 3 s)                    | Frequency converters        |

## PHYSICAL SPECIFICATIONS

| Materials  |                                 |
|------------|---------------------------------|
| Transducer | Stainless steel (316L / 1.4435) |
| Housing    | Stainless steel (316L / 1.4404) |
| Seals      | Viton (standard)                |
| Cable      | PUR, FEP, PE                    |

(1) Specification for a ATM.1ST/T, G1/2, DIN-Connector

## Equipment

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### OVERVIEW

| 10.00.0091 | Accessories overview   |
|------------|------------------------|
| HART001    | Cable Socket Connector |

## Additional documents

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### OPERATING AND SAFETY INSTRUCTIONS

| Article number |        |
|----------------|--------|
| 10.88.0092     | DMM029 |

# Ordering information

|                                 | X.  | XXXX.    | XXXX. | XX. | XXX |
|---------------------------------|---|----------|-------|-----|-----|
| <b>Type</b>                     |   |          |       |     |     |
|                                 | ATM.1ST/T   |          |       |     |     |
| <b>Pressure type</b>            |   |          |       |     |     |
|                                 | Gauge   | 1        |       |     |     |
|                                 | Absolute (vacuum)   | 2        |       |     |     |
|                                 | Sealed gauge  | 3        |       |     |     |
| <b>Pressure measuring range</b> |   |          |       |     |     |
|                                 | 100 mbar ... 25 bar (1)   |          | XX    |     |     |
| <b>Process connection</b>       |   |          |       |     |     |
|                                 | G 1/2 M, probe Ø4 x 6.3mm, (Fig. 1)   |          | 72    |     |     |
|                                 | 1/2 NPT M, probe Ø4 x 2.8mm, (Fig. 2)   |          | 73    |     |     |
|                                 | Customized  |          | 99    |     |     |
| <b>Electrical connection</b>    |   |          |       |     |     |
|                                 | DIN-43650, with metal threaded part, demountable, IP 65 (Fig. 3), (3)                         |          | 01    |     |     |
|                                 | M16 (Binder 723), 5 pins, IP 67 (Fig. 4), (3)   |          | 03    |     |     |
|                                 | M16 (Binder 723), 5 pins, demountable, IP 67 (Fig. 5), (3)                                    |          | 43    |     |     |
|                                 | MIL C26482, 10-6, IP 40 (Fig. 6), (3)   |          | 06    |     |     |
|                                 | PE cable, black, IP 67 (Fig. 7), (4), (5)   |          | 13    |     |     |
|                                 | PUR cable, black, IP 67 (Fig. 7), (4), (6)  |          | 15    |     |     |
|                                 | FEP cable, black, IP 67 (Fig. 7), (4)   |          | 21    |     |     |
|                                 | FEP cable, (high temperature), black, IP 67 (Fig. 4), (4), (7)                                |          | 11    |     |     |
|                                 | Customized connection   |          | 99    |     |     |
| <b>Output signal</b>            |   |          |       |     |     |
|                                 | 4 ... 20 mA (3 wire)  |          | 03    |     |     |
|                                 | 4 ... 20 mA (4 wire)  |          | 05    |     |     |
| <b>Accuracy</b>                 |   |          |       |     |     |
|                                 | ≤ ± 0.25 % FS   |          |       | 1   |     |
|                                 | ≤ ± 0.1 % FS  |          |       | 2   |     |
| <b>Temperature range</b>        |   |          |       |     |     |
|                                 | 0 ... 70°C compensated<br>process temperature: -40 ... 125°C                                  | (allowed |       | 0   |     |
|                                 | -25 ... 100°C compensated<br>(allowed process temperature: -40 ... 125°C)                     |          |       | 1   |     |
|                                 | -40 ... 100°C compensated<br>(allowed process temperature: -40 ... 125°C)                     |          |       | 3   |     |
|                                 | 40 ... 100°C compensated<br>(allowed process temperature: -40 ... 150°C)<br>with cooling fins |          |       | 4   |     |
|                                 | Customized  |          |       | 9   |     |
| <b>Option 1</b>                 |   |          |       |     |     |
|                                 | Special oil filling: Anderol Food<br>food applications)                                       | (for     |       |     | G   |
|                                 | Special oil filling: PAO4 (silicon free)  |          |       |     | Q   |
| <b>Option 2</b>                 |   |          |       |     |     |
| <b>Option 3</b>                 |   |          |       |     |     |
|                                 | Seals: Viton (standard)   |          |       |     | U   |

- (1) 50 mbar on request
- (3) Cable socket connector not included
- (4) Please specify the required cable length and medium
- (5) Suitable for drinking water (food approved)
- (6) For operating temperature > 50°C, PE or FEP cable must be used, with connector
- (7) max. 130°C @ 10 mH<sub>2</sub>O, max. 110°C @ 50 mH<sub>2</sub>O

## Pressure Connections

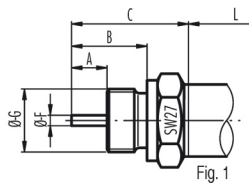


Fig. 1

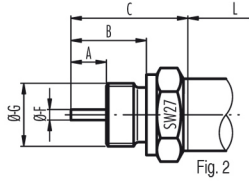
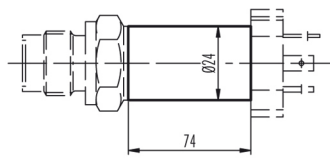
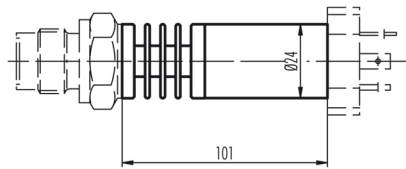


Fig. 2

Version for media temperature up to 125°C



Version for media temperature >125°C up to 150°C



## Dimensions

## Electrical Connections

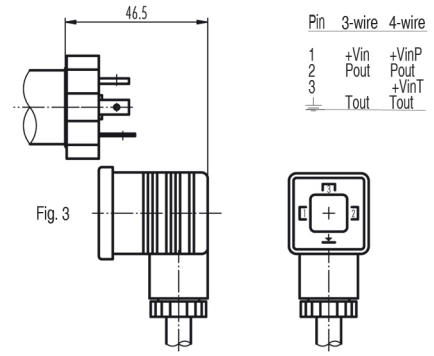


Fig. 3

| Pin | 3-wire | 4-wire |
|-----|--------|--------|
| 1   | +Vin   | +VinP  |
| 2   | Pout   | Pout   |
| 3   |        | +VinT  |
| 4   | Tout   | Tout   |

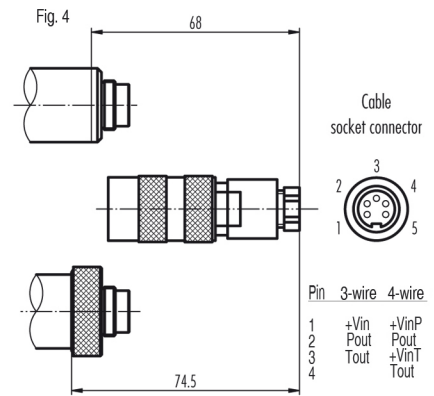


Fig. 4

Cable socket connector



| Pin | 3-wire | 4-wire |
|-----|--------|--------|
| 1   | +Vin   | +VinP  |
| 2   | Pout   | Pout   |
| 3   | Tout   | +VinT  |
| 4   |        | Tout   |

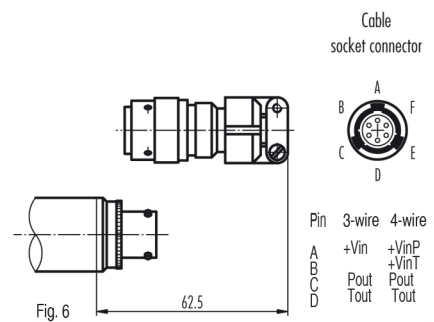


Fig. 5

Cable socket connector



| Pin | 3-wire | 4-wire |
|-----|--------|--------|
| A   | +Vin   | +VinP  |
| B   |        | +VinT  |
| C   | Pout   | Pout   |
| D   | Tout   | Tout   |

| Probe  | A   | B    | C    | Ø-F (Probe) | Ø-G (Thread) |
|--------|-----|------|------|-------------|--------------|
| Fig. 1 | 6.3 | 19.8 | 32.5 | 4           | G 1/2 M      |
| Fig. 2 | 2.8 | 19.8 | 32.5 | 4           | 1/2 NPT M    |

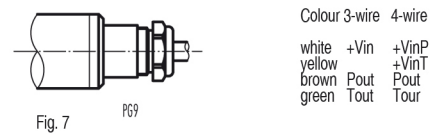


Fig. 6

| Colour | 3-wire | 4-wire |
|--------|--------|--------|
| white  | +Vin   | +VinP  |
| yellow |        | +VinT  |
| brown  | Pout   | Pout   |
| green  | Tout   | Tout   |



Fig. 7